

EXHIBIT A

Via FedEx

October 8, 2010

Ms. Laura Majerus
Patent Counsel
Google Inc.
1600 Amphitheatre Parkway
Mountain View, CA 94043

Dear Ms. Majerus,

In connection with the AVC Patent Portfolio License ("AVC License") concluded by Google, Inc. ("Google"), MPEG LA, LLC ("MPEG LA") is pleased to provide the following understanding:

While the AVC License does not contain a term under which all Affiliates of Google may receive coverage under Google's AVC License, and each Affiliate may take its own AVC License in its own name, Google desires to include its Affiliates in its license grant pursuant to the AVC License.

In addition, Google warrants and represents that it has the authority to bind any and all of its Affiliates to the conditions and terms of its AVC License.

Therefore, Google and MPEG LA agree to the following:

1. Google will submit to MPEG LA a list of Affiliate(s), each a Legal Entity that it wishes to include in its license grant under the AVC License. Such entities will hereinafter be referred to as "Covered Affiliates." Covered Affiliates will be listed in Attachment A to this Agreement and may be updated from time to time if Google provides written notice of its desire to include or remove Affiliates and MPEG LA consents to such inclusion (manifested by the listing of the Affiliate(s) in the updated Attachment A, which will be sent to Google), where such consent shall not be unreasonably withheld.
2. Each Covered Affiliate shall be bound by the terms and conditions of the AVC License as if it were named as a Licensee to the AVC License. Any and all royalties associated to the activities of Google and each Covered Affiliate(s) will be paid by Google, and Google shall pay any and all amounts in accordance with the AVC License. Except for the foregoing, nothing in this Attachment shall change any obligations and rights, including without limitation, the maximum annual royalties payable by an Enterprise per Calendar Year under the AVC License ("Enterprise Caps").
3. Google guarantees performance of all duties and obligations of its Covered Affiliate(s) under the AVC License. If any Covered Affiliate(s) breaches or does not perform a duty or obligation under the AVC License, Google shall immediately cure such breach or perform such duty or obligation, and Google agrees that MPEG LA shall have the right to proceed directly against Google for such breach or non-performance.

4. If Google pays the Enterprise Cap for (a) AVC Video by electing the Enterprise License under Section 3.1.7 of the AVC License, (b) AVC Products by paying the maximum annual royalty as specified in Section 3.1.1, or (c) OEM AVC Products by paying the maximum annual royalty as specified in Section 3.1.6, all Affiliates of Google which are i) Licensees to their own AVC License, or ii) Covered Affiliates under this Agreement, shall be covered under the Enterprise Caps in Sections 3.1.1, 3.1.6 or 3.1.7 as described above.
5. In the event that Google pays the Enterprise Cap for any of (i) AVC Products, (ii) AVC Video, or iii) OEM AVC Products for a particular Calendar Year, and after the payment of the Enterprise Cap Google acquires a Legal Entity which Sold AVC Products or AVC Video prior to Google's acquisition, and the Legal Entity was not an AVC Licensee with MPEG LA or otherwise was licensed under all AVC Essential Patents in the AVC Patent Portfolio, Google will pay the applicable royalties for such historic AVC Products or AVC Video Sold by the newly acquired Legal Entity as if the Legal Entity was not a part of Google's Enterprise. Any AVC Products or AVC Video Sold going forward from the date Google acquired the Legal Entity would fall under Google's Enterprise Cap.
6. All capitalized terms used in this Agreement shall have the same meaning as in the AVC License.
7. This letter shall be considered an "attachment" as that term is used in Section 8.18.1 of the AVC License.

Date:	By:
	MPEG LA, LLC
Date:	By:
	Google, Inc.

EXHIBIT B



February 27, 2009

Via email (cc Federal Express)

Baryn S. Futa
Manager and Chief Executive Officer
MPEG LA, L.L.C.
250 Steele Street, Suite 300
Denver, CO 80206
bfuta@mpgela.com

Re: Notification of Affiliates pursuant to Section 3.3 of AVC Patent Portfolio License

Dear Mr. Futa:

Pursuant to Section 3.3 of AVC Patent Portfolio License, Google Inc. hereby provides written notification of the identity of the current Affiliates listed in the Attachment A.

Sincerely,

A handwritten signature in cursive script, reading "Laura Majerus", is positioned above the typed name and title.

Laura A. Majerus
Patent Counsel
Google Inc.
1600 Amphitheatre Parkway
Mountain View, CA 94043
650-253-0000

ATTACHMENT A

List of current Affiliates of Google Inc., pursuant to Section 3.3 of AVC Patent Portfolio License

1. YouTube, LLC, a Delaware Corporation
2. Picasa, LLC, a Delaware Corporation
3. Android, Inc., a Delaware Corporation
4. Omnisio, Inc., a Delaware Corporation
5. Picasa, L.L.C., a Delaware Corporation
6. DoubleClick Holding Corp, a Delaware Corporation

EXHIBIT C

From: [Laura Majerus](#)
To: [Royalty Statements](#)
Cc: [Ryan Rodriguez](#)
Subject: Re: Google Inc. - AVC Enterprise Election (Thread:45248)
Date: Monday, February 28, 2011 5:08:19 PM

Dear Darcy, Google Inc. and its affiliates hereby provide written notice under section 3.1.1 of the AVC Patent Portfolio License (hereinafter "the AVC License") that we elect to pay the amount specified in section 3.1.1 (\$6,500,000) for calendar year 2011. We plan to pay this amount by March 31, 2011.

Further to the notice provided in our letter of February 28, 2010, we further provide written notification under section 3.1.6.1 of the AVC License that Google Inc. will begin shipping ChromeOS sometime in 2011 and will pay OEM license fees, should chrome OS qualify as an OEM AVC Product under section 1.33 of the AVC License.

On a related note, we plan to send the signed affiliate license (an addendum to the AVC License) to Ryan Rodriguez of MPEGLA for signature today or tomorrow.

Laura Majerus
Patent Counsel
Google Inc.
650-253-0048

On Fri, Feb 11, 2011 at 12:07 PM, MPEG LA Royalty Services
<RoyaltyStatements@mpegla.com> wrote:

Dear Laura,

Can you please inform me if Google will elect the AVC 3.1.1 (Encoders and Decoders) Enterprise License for 2011?

Please provide me with a response no later than 28-Feb-11. Thank you for your help.

With kind regards,

Darcey Feiertag
Royalty Services
MPEG LA, LLC
[303-331-1880](tel:303-331-1880) Ext. 138
FAX [303-331-1879](tel:303-331-1879)

RoyaltyStatements@mpegla.com

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EXHIBIT D

From: [Laura Majerus](#)
To: [Royalty Statements](#)
Cc: [Alana Walker](#)
Subject: Re: Payment Reminder - Google Inc - AVC (Thread:76997)
Date: Tuesday, February 28, 2012 7:17:48 PM

Dear Darcy,

This email is to provide notice under section 3.1.1 of Google's AVC license that we will be paying the cap amount of \$6,500,000 on or before March 30, 2012. This will cover Jan 1, 2012-December 31, 2012 for AVC Products..

Laura Majerus

On Tue, Feb 7, 2012 at 10:50 AM, MPEG LA Royalty Services
<RoyaltyStatements@mpegla.com> wrote:

Dear Laura Majerus:

Please confirm that Google Inc. will elect the AVC 3.1.1 (Encoder/Decoder/Codec) product cap of \$6,500,000.00 for 01-Jan-2012 to 31-Dec-2012. Confirmation is due by **28-Feb-2012** and corresponding royalty payment is due by **31-Mar-2012**.

With kind regards,

Darcey Feiertag
Royalty Services
MPEG LA, LLC
[303-331-1880 Ext. 138](tel:303-331-1880)
FAX [303-331-1879](tel:303-331-1879)

RoyaltyStatements@mpegla.com

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Laura Majerus
Patent Counsel
Google Inc.
[650-253-0048](tel:650-253-0048)

EXHIBIT E

Larry Horn

(BA Yale, JD Columbia)

is Vice-President, Licensing and Business Development at MPEG LA. Prior to that, he was Head, Business Development, Marketing, Sales at Martek Biosciences Corporation.

Alternative approaches to IP management: One-stop technology platform licensing

Larry Horn

Date received (in revised form): 19th September, 2002

Abstract

As a pioneering, one-stop technology platform licensing enterprise, MPEG LA is presented as a template for patent pooling. By providing the marketplace with fair, reasonable, non-discriminatory access to a portfolio of worldwide essential patents under a single licence, this example of a one-stop technology platform licensing programme enables widespread implementation, interoperability and use of fundamental broad-based technologies covered by many patents owned by many patent owners. This paper will: (1) present observations from MPEG LA's unique experience and perspective including a description of the necessary elements and principles on which such efforts are based, what works and why; and (2) describe efforts to apply this innovative licensing model to the biotechnology and pharmaceutical industries within the larger context of historical patent pooling as a solution to biotechnology bottlenecks.

Keywords: *patent pools, intellectual property, one-stop*

INTRODUCTION

In today's biotechnology and pharmaceutical markets, battle lines are often drawn between those who have strong intellectual property (IP) positions and those who do not. Those with strong IP positions choose either to retain the technology exclusively for their own use or transfer it under exclusive bilateral licensing arrangements and strategic alliances – in either case resulting in limited access. Those with weak IP positions may favour placing the fruits of biotechnology research in the public domain,¹ but the results are mixed since this runs counter to the incentives that fuel research and development by entitling IP owners to the fruits of their inventive labours. There is another way. By preserving the incentives that drive commercial investment and technology development, one-stop technology platform licensing balances a patent holder's expectation of a reasonable return on its IP with the market's interest in the widespread availability of technology while encouraging technological

innovation through vigorous marketplace competition. It may not be the right fit in all cases or for all parties, but it can work with any technology and where it fits, does not preclude independently negotiated bilateral licensing arrangements for those who want them.

This innovative patent licensing model has been successfully employed by the electronics and video content industries since 1997. By providing access to essential IP on fair, reasonable, non-discriminatory terms to all users under a single licence, the one-stop technology platform licence (or 'patent pool' as it is often called) enables widespread implementation, interoperability and use of fundamental broad-based technologies covered by many patents owned by many patent owners. One reason for its success is that the electronics and video content industries are accustomed to the use of standards. Development costs are high and product manufacturers and content providers have rallied around the use of standards in order to foster compatibility that encourages both industry and

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In their use of fundamental diagnostics and drug development technologies involving numerous patent holders, the biotech/pharma industry faces the potential for confusion, conflict, uncertainty and costs

consumers to invest in new products. But, products and the standards on which they are based increasingly rely upon many patents owned by many patent owners. Therefore, if the 'thicket'² of essential IP rights underlying their use cannot be accessed under reasonable terms and conditions (eg cost) applied evenly to all similarly situated competitors, the best of standards often go unused.

In their use of fundamental diagnostics and drug development technologies that employ many patents owned by many different patent holders, the biotechnology and pharmaceutical industry ('biotech/pharma'), like the electronics and video content industries, also faces the potential for confusion, litigation conflict, uncertainty and cost. But what are the conditions and incentives that would lead biotech/pharma to employ the patent pool solution? This paper presents observations and case studies from the unique experience and perspective of one-stop technology platform licences that have been employed successfully in the electronics and video content industries, examines the marketplace issues and conditions unique to biotech/pharma that may affect the use of this innovative new licensing model in that industry and offers some thoughts for resolving them.

MPEG LA: A BUSINESS MODEL

MPEG LA, LLC, pioneered one-stop technology platform licensing starting with the core international digital video compression standard known as MPEG-2.³ The single biggest challenge to MPEG-2's adoption was dealing with the essential IP rights in an orderly, cost-effective way. Many patents owned by many patent holders created the potential for confusion, litigation conflict, uncertainty and cost. MPEG LA provided the solution.

MPEG LA was organised as a licensing administrator company in 1996 and in July 1997, following issuance of a Business Review letter from the US

Department of Justice's Antitrust Division,⁴ began licensing the MPEG-2 Patent Portfolio License. Since the programme's inception, 14 new patent owners and more than 425 essential patents have been added. The MPEG-2 Patent Portfolio License has grown from the original 8 patent owners and 100 essential patents (25 patent families) to include more than 525 essential patents (111 patent families) in 54 countries owned by 21 companies and a leading university.⁵ There are now almost 500 Licensees to the MPEG-2 License.⁶ As the legal and business template for one-stop technology platform licensing, MPEG LA also provides an innovative way to achieve fair, reasonable, non-discriminatory access to patent rights for other technology standards.⁷⁻¹⁰

WHAT PROBLEM DOES IT SOLVE?

Expansion of broad standards and fundamental platform technologies means a growing interdependence among complementary patents necessary to implement them. In addition, there has been enormous growth in the number of issued patents containing progressively narrower claims. Therefore, licences under multiple patents owned by multiple patent owners are required. In the absence of a patent pool, the transaction costs required to identify the blocking patents and conclude negotiations for a licence under each of them (assuming the patent owners are even willing to enter into licence negotiations), to say nothing of paying multiple royalties, are too costly for the average user – with the result that technological advancement, adoption and use are impeded; freedom of technological movement is restricted; the potential for conflict is increased; and traditional one-on-one licensing arrangements fall short.

As Garrard Beeney noted in testimony before the US Department of Justice Antitrust Division and the Federal Trade Commission:¹¹

Transaction costs required to identify blocking patents and conclude negotiations for a licence under each of them are too costly for the average user

... product standardization and joint product development naturally and inescapably lead to a proliferation of IP held by numerous companies covering a single product – a phenomenon Professor Shapiro has referred to ... as the ‘patent thicket.’²

In addition, as further noted by Mr Beeney:

The growth of patent thickets has been fueled not just by product standardization and joint development, but also by the explosion in the number of patent applications and patent grants. The United States Department of Commerce reports that both patent applications and grants doubled between 1988 and 2000.¹²

In the case of MPEG-2, however, where the MPEG-2 Patent Portfolio License enables users to acquire patent rights necessary for compliance with the standard in a single transaction rather than through separate licence agreements with multiple patent owners, wide acceptance of the licence across all market sectors¹³ has enabled the worldwide technological implementation, interoperability and use of digital video across myriad applications.¹⁴ Like the MPEG-2 Standard that it covers, the MPEG-2 Patent Portfolio License encourages technological improvement, competition and innovation in and outside of the Standard. Not only are licensees free to develop competing products within or outside of the standard, but in addition to the variety of products that use MPEG-2, the marketplace in fact utilises many different video compression standards.

WHAT WORKS AND WHY

In addition to the market conditions that create the appropriate incentives and need for a one-stop technology platform licence product, certain legal, marketing and organisational elements are necessary to ensure its success. Apart from the fact that these elements promote the pro-competitiveness of an IP pool, most of

them are determined and assured by the marketplace itself.

First, the legal and marketing elements:

- **Fair, reasonable, non-discriminatory access to essential IP** – patent holders grant the licensing administrator a non-exclusive right to license their essential patents over their useful life. The licensing administrator offers the same licence agreement to everyone and is empowered to sign up licensees and take necessary actions to achieve compliance with the licence terms.
- **‘Essentiality’ and a defined field of use** – a patent may not be included unless it is infringed by use of (‘essential’ to) the defined technology. To ensure fair, reliable results, independent patent experts in various jurisdictions are employed to evaluate patents for their essentiality. In general, ‘essentiality’ and a defined field of use communicate clearly to both licensors and licensees the rights granted by the licence and why patents are included or excluded. As a legal matter, this is necessary to ensure that the licence is specific enough to include what a licensee needs to practise the particular technology and that competitive implementation options are neither favoured nor foreclosed.¹⁵ Since each patent is essential, the royalty rate and thus the value is the same whether a licensee uses one or more patents, and the licence, in effect, conveys the IP rights necessary to enter the field. As a marketing matter, unless a licence is well defined, the customer will not know what it is buying and will be reluctant to sign up. Similarly, if the licence requires a royalty for non-essential patents, the customer who does not need them will not agree to pay for them. Further, a licence with patents that have not been evaluated by an independent patent expert will lack credibility and be difficult to sell.

Certain legal, marketing and organisational elements are necessary to ensure (a one-stop technology platform licence product’s) success

‘Essentiality’ and a defined field of use communicate clearly to both licensors and licensees the rights granted by the licence and why patents are included or excluded

To the extent that a licensee independently negotiates a licence directly with a patent owner, that is a matter to be worked out directly between them

Licensees are assured most favourable royalty rates and pay the same royalties to the licensing administrator whether or not they are patent owners

A fair, unbiased process, for the continuing evaluation of patents for their essentiality and inclusion must be provided

- **Non-exclusive** – other (eg bilateral) licensing options are not foreclosed either to licensors or licensees. To the extent that a licensee independently negotiates a licence directly with a patent owner, that is a matter to be worked out directly between them. The licensing administrator does not become involved in such negotiations, and any adjustments the parties may wish to make as a result of their bilateral licence is a matter between them not involving the licensing administrator. Although not legally mandated, this policy is important to licensees to know that they will be treated the same and pay the same royalties to the licensing administrator as any other similarly situated licensee (whether or not a patent holder). If the licensing administrator is hesitant to provide that assurance, prospective licensees are reluctant to sign.

- **Licensee protections** – the typical licence agreement contains numerous provisions to assure that licensees are treated fairly and reasonably. Among them are the following: (a) Licensees are assured most favourable royalty rates and pay the same royalties to the licensing administrator whether or not they are patent owners.¹⁶ (b) To ensure complete coverage, patent holders are required to include all of their essential patents worldwide. (c) Licence grants are clear in scope. (d) To ensure, for the benefit of all licensees, that a licensee does not take advantage of the licence, on the one hand, yet refuse to license its own essential patents on fair and reasonable terms, any licensee is free to add essential patents to the licence that it or an affiliate may own on the same terms and conditions as the licensors, but if a licensee chooses not to do so, it agrees to grant back a licence similar in scope to the licence granted to the licensee on fair and reasonable terms under any essential patents it may own. (e) Licensee sales data is protected as

confidential from patent holders and licensees. (f) A clear up-to-date list of licensed patents is maintained.

- **The objective of the licence is to include as much essential IP as possible** for the convenience of the marketplace, although no assurance is or can be made that a pool licence includes every essential patent. Therefore, a fair, unbiased process for the continuing evaluation of patents for their essentiality and inclusion must be provided. Any patent owners that believe they own an essential patent is welcome to submit it for evaluation of essentiality and inclusion in the licence on the same terms as the other patent holders following successful evaluation. Not only does this ensure the openness of the licence to the inclusion of as much essential IP as possible, but it also enhances the credibility, value and marketability of the licence.
- **Licensor protections** – among other things, licensors share in a reasonable allocation of royalties commensurate with their contributions to the licence. In addition, to prevent licensees from using the licence to protect themselves from lawsuit in order to sue others on their own patents and to encourage negotiation and innovation in support of the technology platform, a patent holder may remove its patents from coverage as to a particular licensee if the licensee brings a lawsuit or other proceeding for infringement of an essential or related patent against the licensor and has refused to grant the licensor a licence on fair and reasonable terms and conditions under such patents on which the lawsuit is based.

Now turning to the organisational elements:

- **Professional management** – the Licensing Administrator provides a

seamless worldwide connection among patent owners, users and technology. This requires a financially sound and motivated organisation with expertise in joint licensing administration; building consensus among fiercely independent patent holders each with its own expectations of value; the development of joint licence products that meet patent holders' interest in a reasonable return and the interest of the marketplace in access to fundamental technology under fair, reasonable terms; IP, anti-trust, contract drafting and administration and taxation; licensing and marketing; web site management; transaction fulfilment and auditing; and international tax mitigation and reconciliation.

... unlike the electronics and video content industries, it is not clear that the biotech/pharma industry views these as problems to be immediately overcome

Business models should be determined by market needs and driven by the desire to create a positive economic opportunity for both licensors and licensees ...

Each licence must be priced to sell

- **Independence** – the licensing administrator is neither a licensor nor a licensee. Its allegiance is to fair, impartial administration of the licensing programme, each administered separately from others.
- **Openness to new business models** – business models should be determined by market needs, and driven by the desire to create a positive economic opportunity for both licensors and licensees and should balance the interest in realising a reasonable return on IP with the interest in providing reasonable access.
- **Emphasis on marketability and integrity of the licensing product** – each licence is based on value given for value received. Therefore, it must be responsive to the marketplace and priced to sell. Since both buyers and sellers are necessary, royalties must be fair and reasonable, and prospective users, like all customers, should be engaged in dialogue leading to the formation of the licence.
- **Legal tenability** – The licensing programme must be in compliance with antitrust laws.

BIOTECH/PHARMA: PROBLEMS IN COMMON

The problems – expansion of broad standards and fundamental platform technologies leading to a growing interdependence among complementary patents necessary to implement them; enormous growth in the number of issued patents containing progressively narrower claims; need for licences under multiple patents owned by multiple patent owners; increasingly burdensome transaction costs; impairment of technological advancement, implementation and use; restricted freedom of movement, increased potential for litigation conflict and uncertainty; and the inability of one-on-one licensing arrangements to respond^{17,18} – are no less present in biotech/pharma than they are in the electronics and video content industries. But, unlike the electronics and video content industries, it is not as clear that the biotech/pharma industry views these as problems to be immediately overcome.

BIOTECH/PHARMA: WHAT'S DIFFERENT?

Biotech/pharma differs from the consumer electronics, computer and content industries in ways that may limit the feasibility of one-stop technology platform licensing:

- Biotech/pharma is not standards-driven.
- Interoperability may be desirable in research, discovery and diagnostics but not at the outer edge of the therapeutic product development chain.
- Many companies are founded and funded on the basis of their proprietary technologies and are, therefore, unwilling to part with them.
- Given the differences among products and technologies, biotech/pharma has a bunker mentality focused on self-protection.

A strong endorsement for patent pools is that they provide a way for patent holders as well as licensees to minimise risk

- There is a greater likelihood of disagreement over patent values.¹⁸
- Platform technologies and fields of use are difficult to define in the absence of standards.

BIOTECH/PHARMA: BARRIERS TO ADOPTION

To address these differences, the following barriers need to be overcome in order for one-stop technology platform licences to be adopted in the biotech/pharma industry:

It is easy to imagine the incentive for licensees but finding the incentive that will cause patent holders to include their patents in a one-stop technology platform licence may be more difficult

- Finding the incentive – it is easy to imagine the incentive for licensees but finding the incentive that will cause patent holders (licensors) to include their patents in a one-stop technology platform licence may be more difficult.
- Defining essentiality/setting field of use boundaries.
- Determining what the market needs.

OVERCOMING THE BARRIERS

Finding the incentive

A one-stop technology standards licence must benefit the public interest, address the need for interoperability and access, provide a means of reducing the potential for litigation conflict, enhance the freedom to operate and reduce the costs of negotiating licences with many parties for many patents. However, none of these factors in and of themselves may be enough to provide the necessary incentive that will persuade patent holders to contribute their IP. For many patent holders, patent infringement is a cost of doing business. But, as noted by Marks *et al.*¹⁸ ‘there are forces and factors at work that make pooling biotech patents more attractive than ever before.’ Among them are new revenue streams from joint licensing outside of the patent holder’s primary business focus and more remotely, the threat of compulsory licences.¹⁹ A strong endorsement for

patent pools is that they provide a way for patent holders as well as licensees to minimise risk. As proffered by Grassler and Capria,¹ ‘it is likely that the combined factors of the price, the volume of licensees, and the low cost of out-licensing for the contributing members would be sufficient encouragement for sufficient numbers of patentees to participate in the pool.’²⁰ This is especially true where one patent is indistinguishable from another in its ability to block implementation of the subject technology, and where, as Grassler and Capria point out, the patents ‘do not provide strong market differentiation to the dominating patent owner’s product.’²⁰

Defining essentiality/setting of field of use boundaries

While the lack of standards in the biotech/pharma industry may present a problem of desire and familiarity, it should not be a problem of construction for a biotech/pharma patent pool. Standards are a helpful way of ensuring that the element of ‘essentiality and a defined field of use’ can be satisfied, but they are not the only way. As long as the licence grant is defined with the precision necessary to ensure that the licence is specific enough to include what a licensee needs to practise the particular technology and to communicate clearly to both licensors and licensees the rights granted by the licence and why patents are included or excluded, then the absence of an official standard is of no consequence.¹ For example, in lieu of a standard, the creation of a *de facto* or quasi-standard bounded by a definable ‘four-sided’ limitation or box consisting of complementary patent rights that are essential to the use of the defined field of use will suffice. The challenge is to identify those areas where interdependent patents are necessary to practise a technology that can be defined as a platform in lieu of an existing standard. This will likely be at the research, discovery and diagnostics or lowest

The challenge is to identify those areas where interdependent patents are necessary to practise a technology that can be defined as a platform in lieu of an existing standard

Areas of interest will likely be at the research, discovery and diagnostics level rather than at the outer edge of the therapeutic product development value chain, thereby enabling a patent owner to provide non-exclusive access while retaining exclusivity over its proprietary birthright

common denominator level rather than at the outer edge of the therapeutic product development value chain, thereby enabling a patent owner to provide non-exclusive access while retaining exclusivity over its proprietary birthright in its area of focus.¹ Like MPEG-2, it will be a technology platform that does not establish end product requirements but is flexible within a broad functional range, thereby encouraging the creation of myriad applications. In their article Grassler and Capria¹ suggest 'libraries of targets' or 'high-throughput screening' as one possibility. Other possibilities include broad diagnostic (eg mass spectrometry), drug discovery and design (combinatorial or structure-based drug design techniques) or drug structure (eg therapeutic antibody) platforms.²¹

Determining what the market needs

The lowest common denominator will be a point which satisfies the need for interoperability and access, provides a means for reducing the potential for litigation conflict and reduces the costs of negotiating licences with many parties under many patents. It will provide technology users with the freedom to operate with reduced risk in otherwise uncertain areas.²¹ Consistent with the above discussion, this is likely to be a drug discovery tool or development platform readily used by a broad cross-section of research laboratories and pharmaceutical companies willing to pay a reasonable price for risk avoidance that frees them to focus their full-time effort on competing vigorously to develop new drugs.

CONCLUSION

The need for one-stop technology platform licensing in the biotech/pharma industry is apparent, and its impact on life-enhancing benefits could be profound. Based on the foregoing analysis of the relevant issues, a one-stop technology platform licence is foreseeable in the near future. A competitive marketplace, healthy business climate,

enhanced quality of life: one-stop technology platform licences will be good for consumers and business alike.

References and notes

1. The SNP consortium is one example. See Grassler and Capria (2002), 'Patent pooling: Uncorking a technology transfer bottleneck and creating value in the biomedical research field', *J. Comm. Biotechnol.*, Vol. 9(2), 15–22.
2. Shapiro, C. (2001), 'Navigating the patent thicket: cross licenses, patent pools and standard setting' (URL: <http://haas.berkeley.edu/~shapiro/thicket.pdf>).
3. MPEG-2 refers to a fundamental technology underlying the efficient transmission, storage and display of digitised moving images and sound tracks on which high definition television (HDTV), digital video broadcasting (DVB and ATSC), direct broadcast by satellite (DBS), digital cable television systems, multichannel-multipoint distribution services (MMDS), personal computer video, digital versatile discs (DVD), interactive media and other forms of digital video delivery, storage, transport and display are based. MPEG-2 is an open technology, giving users a wide interoperable range of cost and quality options within the computation that compresses data to produce an MPEG-2 video stream. The MPEG-2 standard does not set hardware requirements; it is flexible within a broad functional range, thereby ensuring the interoperability of myriad applications. For more information, see URLs: <http://www.csl.it/mpeg> and <http://www.mpeg.org>
4. Business Review Letter from Hon. Joel I. Klein to Garrard R. Beeney (26th June, 1997), available at URL: <http://www.usdoj.gov/atr/public/busreview/1170.htm>. The European Commission issued a comfort letter in December 1998 (Case No IV/C.3/36.849).
5. Current patent holders include Canon, Inc., Columbia University, France Telecom R&D, Fujitsu, GE Technology Development, Inc., General Instrument Corporation, Hitachi, Ltd, KDDI Corporation, Matsushita, Mitsubishi, Nippon Telegraph and Telephone Corporation (NTT), Koninklijke Philips Electronics NV, US Philips, Robert Bosch GmbH, Samsung Electronics Co., Ltd, Sanyo Electronic Co., Ltd, Scientific Atlanta, Sharp Kabushiki Kaisha, Sony, Thomson Licensing S.A., Toshiba Corporation, and Victor Company of Japan, Ltd (JVC).
6. URL: <http://www.mpegla.com>
7. A licensing programme for the high-speed transfer digital interconnect standard known as IEEE 1394 was organised in November 1999. The 1394 Patent Portfolio License includes essential patents owned by Apple Computer,

The lowest common denominator will provide technology users with the freedom to operate with reduced risk

The need for one-stop technology platform licensing in the biotech/pharma industry is apparent, and its impact on life-enhancing benefits could be profound

- Inc., Canon, Inc., Compaq Computer Corporation, Hitachi, Ltd, Koninklijke Philips Electronics, NV, Matsushita Electric Industrial Co., Ltd, Sony Corporation, STMicroelectronics NV and Toshiba Corporation; it now has more than 170 Licensees (URL: <http://www.1394la.com>).
8. In July 2001 MPEG LA launched a licensing programme for the terrestrial digital television standard used in Europe and Asia known as DVB-T. Current patent holders include France Telecom, Koninklijke Philips Electronics NV, Matsushita Electric Industrial Co., Ltd, US Philips Corporations and Victor Company of Japan, Ltd (URL: <http://www.dvbla.com>).
 9. In autumn 2002, MPEG LA will offer the MPEG-4 Visual Patent Portfolio License and the MPEG-4 Systems Patent Portfolio License for use of the MPEG-4 Visual and Systems standards, respectively. MPEG-4 Visual Patent holders will include Canon Inc.; France Télécom; Fujitsu Limited; GE Technology Development, Inc.; General Instrument Corp.; Hitachi, Ltd; Hyundai Curitel, Inc.; KDDI Corporation; Matsushita Electric Industrial Co., Ltd; Microsoft Corporation; Mitsubishi Electric Corporation; Oki Electric Industry Co., Ltd; Philips Electronics; Samsung Electronics Co., Ltd; Sanyo Electric Co., Ltd; Sharp Kabushiki Kaisha; Sony Corporation; Telenor AS; Toshiba Corporation; and Victor Company of Japan, Limited. MPEG-4 Systems patent holders will include Apple Computer, Inc.; Electronics and Telecommunications Research Institute (ETRI); France Télécom; Mitsubishi Electric Corporation; Philips Electronics; Samsung Electronics Corporation, and Sun Microsystems, Inc. (URLs: http://biz.yahoo.com/bw/020715/150498_1.html; see <http://www.mpegla.com/mpeg4>).
 10. MPEG LA continues to work on the development of joint licences in connection with other emerging technologies, including biotech/pharma in which it has been promoting the concept of a patent pool licence and working to create one since July 1997. See also Marks, M. S., Schmickel, D. B. and Bednarek, M. D. (2001), 'Unity in the gene pool', *Intellectual Property*, 8th October.
 11. Beeney, G. (2002), 'Pro-Competitive Aspects of Intellectual Property Pools: A Proposal for Safe Harbor Provisions', United States Department of Justice Antitrust Division and the Federal Trade Commission Joint Hearings on Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy, 17th April (URL: <http://www.ftc.gov/opp/intellect/detailsandparticipants.htm#April%2017>). Mr Beeney, a partner with the law firm of Sullivan & Cromwell in New York City, is a leading authority on patent pools. He has participated with the Antitrust Division in two of the three principal Business Review Letters that address patent pools and also with the European Commission.
 12. US Department of Commerce, Patent and Trademark Office (2001), '2001 TAF Special Report – All Patents, All Types, January 1972–December 2000', US Government Printing Office.
 13. MPEG LA's MPEG-2 licensees, now almost 500, make most of the MPEG products in the current world market. See URL: <http://www.mpegla.com/Licensing/Licensees>.
 14. As noted by Baryn S. Futa, Chief Executive Officer of MPEG LA, in testimony before the US Department of Justice Antitrust Division and the Federal Trade Commission

Today MPEG-2 video technology is used in some 300 million decode, encode and transport product units – and by 2006 is expected to increase by more than six-fold. Included are cable, satellite and terrestrial digital set-top boxes; digital television sets; DVD players; video game systems; personal computers; digital video recorders, encoders and multiplexers. And that doesn't even count the billions of DVD discs being produced. All told, through 2006, the estimated value of MPEG-2 products in the world market is projected to exceed half a trillion dollars – and that doesn't even begin to measure the materials that go into the products, the services that surround them or the content that comes out. This is a vigorous market. Thousands of companies employing countless people in the US and around the world make products using or relying on MPEG-2 technology. MPEG-2 has made video communication interoperable, global, competitive, innovative and efficient.
 - Futa, B. (2002), 'Statement of Baryn S. Futa, CEO and Manager, MPEG LA, LLC', The US Department of Justice Antitrust Division and the Federal Trade Commission Joint Hearings on Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy, 17th April (URL: <http://www.ftc.gov/opp/intellect/detailsandparticipants.htm#April%2017>).
 15. See US Department of Justice & Federal Trade Commission, Antitrust Guidelines for the Licensing of Intellectual Property (1995) (URL: <http://www.usdoj.gov>).
 16. In fact, patent holders to MPEG LA's Patent Portfolio Licenses that make products covered by the applicable licence are also licensees and subject to the same terms as non-patent holder licensees.
 17. See Clark, J., Piccolo, J., Stanton, B., Tyson, K., Critharis, M. and Kunin, S. (2000), 'Patent Pools: A Solution to the Problems of Access In Biotechnology Patents?', US Patent and Trademark Office, 5th December (URL:

<http://www.uspto.gov/web/offices/pac/dapp/opla/patpool.htm>).

18. Marks, M. S., Schmickel, D. B. and Bednarek, M. D. (2001), 'Unity in the gene pool', *Intellectual Property*, 8th October.
19. As pointed out in Clark *et al.*,¹⁷ the demand for access to research data could be among the factors that compel the granting of a compulsory licence under certain circumstances. For example, countries that are reluctant to grant patents in such areas as genomics may find that the granting of a patent subject to compulsory licence would help reconcile their concern that certain intellectual property does not constitute patentable subject matter with their domestic interest in encouraging intellectual property ownership. See also Marks *et al.*¹⁸
20. The authors go on to say that all relevant patent owners will be encouraged to contribute because 'If the pool is of a sufficient and significant number of relevant patents, the "industry standard royalty rate" is *de facto* set by the pool and could put downward pressure on damage calculations that would negatively affect a patentee's claim . . .' They also suggest that the desire to perform research in countries without basic research exemptions might provide an additional incentive for licensees.
21. It may be that the full uncertainty and therefore the true value of a patent pool may not be appreciated by the marketplace until such time as products using these technologies generate significant revenues and patent holders seek their share through patent litigation and licensing. For example in the area of drug structure platforms, it has been estimated that in the USA since 1994, monoclonal antibody based therapeutics make up about 22 per cent of the approved biopharmaceutical drugs; Reichert, J. M. (2002), 'Therapeutic monoclonal antibodies: Trends in development and approval in the US', *Curr. Opinion Mol. Therapeut.*, Vol. 4(2), pp. 110–118. Further, between a quarter and a third of the biopharmaceuticals currently in clinical trials are monoclonal antibody-based drugs; J. M. Reichert, personal communication. Similarly, in the area of diagnostic platforms, mass spectrometry is employed in many of the mandatory newborn screening tests for genetic and metabolic disorders (URL: <http://www.yale.edu/opa/newsr/02-06-13-04.all.html>).

EXHIBIT F

Patent pools in high-tech industries

Patent pools are the ideal solution wherever an independently administered, one-stop patent licence would be a convenient alternative providing efficient access to core patented technology

By **Bill Geary**, MPEG LA, Chevy Chase, MD

Consumer electronics, telecommunications, computer and related high-tech industries have successfully employed a patent pool licensing model pioneered by MPEG LA that provides access to core “essential” patents from many companies in a single transaction at a known price. The availability of a patent pool licence allows companies to focus on their business rather than patent licensing, and this in turn encourages innovation through marketplace competition. The MPEG LA® Licensing Model offers fair, reasonable, non-discriminatory access to essential intellectual property from multiple patent owners under a single licence as an alternative to negotiating licences separately with each patent owner. It balances marketplace desire for efficient and widespread access to important technology with patent owners’ expectation of reasonable return on their intellectual property. Next-generation wireless telecommunications technologies may also benefit from this licensing model.

Industry standards and patent thickets

A patent is the grant of a property right covering an invention. The right conferred by the patent generally gives its owner the right to exclude others from making, using, offering for sale, selling or importing a product or process incorporating the

invention in the absence of a licence.

Technology standards and platforms often involve numerous blocking patents owned by many patent owners, and the number of requisite patent licences may be inefficient and too costly for users to negotiate. This is often referred to as a patent thicket. A patent thicket increases uncertainty and conflict, and restricts freedom of design in a technology area, thereby impeding its adoption, interoperability and use.

The first modern patent pool – MPEG-2

In the 1990s the MPEG-2 standard – the core international digital video compression standard required for virtually all digital television including DVD, faced a patent thicket. The single biggest challenge to MPEG-2 adoption was access to essential patents. MPEG-2 patents owned by many parties made it virtually impossible for the standard to be used. Following a seminal business review letter it obtained from the US Department of Justice (a comfort letter was also obtained from the European Commission), MPEG LA offered an alternative patent pool licence as a solution to address the market’s need for transactional efficiency. The licensing model pioneered and employed by MPEG LA enables users of MPEG-2 technology to acquire essential patent rights from multiple patent owners in a single transaction as an alternative to negotiating separate licences with each patent owner.

MPEG LA’s MPEG-2 licensing programme helped to produce the most widely employed standard in consumer electronics history. The MPEG-2 Patent Portfolio Licence includes 880 essential patents in 57 countries owned by 25 patent owners representing leading consumer electronics companies and universities. It has approximately 1,500 licensees, accounting

Figure 2. Companies that are licensors in MPEG LA patent pools, (June 30, 2009 Data)

Alcatel Lucent
Apple Inc.
British Telecommunications plc
Canon, Inc.
CIF Licensing, LLC
Competitive Technologies, Inc.
Columbia University
DAEWOO Electronics Corporation
ETRI (Korea)
France Télécom
Fraunhofer-Gesellschaft
Fujitsu Limited
General Instrument Corp.
GE Technology Development, Inc.
Hitachi, Ltd.
KDDI Corporation
Koninklijke Philips Electronics N.V.
LG Electronics Inc.
Microsoft Corporation
Mitsubishi Electric Corporation
Nippon Telegraph and Telephone Corporation (NTT)
NTT DOCOMO
Oki Electric Industry Co., Ltd.
Panasonic Corporation
Pantech&Curitel Communications, Inc.
Robert Bosch GmbH
Samsung Electronics Co., Ltd.
SANYO Electric Co., Ltd.
Scientific-Atlanta, LLC
Scientific-Atlanta Vancouver Company
Sedna Patent Services, LLC
Sharp Corporation
Siemens AG
Sony Corporation
STMicroelectronics N.V.
Sun Microsystems
Telenor ASA
Thomson Licensing
Toshiba Corporation
Victor Company of Japan (JVC)
Zenith Electronics, LLC

Figure 1. Current MPEG LA licenses*, (June 30, 2009 Data)

MPEG-2 Program started in 1997	<ul style="list-style-type: none"> • 25 patent holders • 880 patents in 57 countries • 1451 licensees
ATSC Program began end of September 2007	<ul style="list-style-type: none"> • 8 patent holders • 118 patents in 22 countries • 97 licensees
AVC/H.264 a/k/a MPEG-4 Part 10 Program started in 2005	<ul style="list-style-type: none"> • 24 patent holders • 768 patents in 41 countries • 634 licensees
VC-1 Program began mid-March 2007	<ul style="list-style-type: none"> • 17 patent holders • 513 patents in 32 countries • 126 licensees
MPEG-4 Visual – Part 2 Program started in 2004	<ul style="list-style-type: none"> • 29 patent holders • 873 patents in 51 countries • 606 licensees
MPEG-2 Systems Program began end of April 2006	<ul style="list-style-type: none"> • 9 patent holders • 190 patents in 29 countries • 68 licensees
IEEE 1394 Program started in 1999	<ul style="list-style-type: none"> • 10 patent holders • 268 patents in 22 countries • 344 licensees

* Detailed information about these programs including the patent lists, royalties, licensors and licensees is available at www.mpegla.com

for most MPEG-2 products in the current world market, including set-top boxes, DVD players, digital television sets, personal computers and DVD video discs. The MPEG LA® Licensing Model has become the template for addressing patent thickets in other widely used technology standards.

Other high-tech patent pools developed by MPEG LA

In addition to MPEG-2, MPEG LA offers patent pools covering the following standards: ATSC digital television, AVC/H.264, MPEG-4 Visual, VC-1, MPEG-2 Systems and IEEE-1394. The number of patents, licensors and licensees in each pool is shown in Figure 1. More than 40 different licensors participate in various MPEG LA pools, as shown in Figure 2.

Patent pools for wireless 4G technology

Wireless telecommunications is undergoing a rapid and dramatic shift from voice networks to data networks. Just as the shift from analogue video to digital video in the 1990s required broad adoption of MPEG-2 and other digital video standards and resulted in the development of patent pools to provide widespread access to the underlying core technology, the shift from wireless voice networks to wireless data networks using broadly adopted worldwide standards will benefit from patent pools to provide widespread

access to the underlying core wireless technology. The wireless standard provides the platform for efficient interoperability and a patent pool provides efficient access to the core patents underlying the standard, fuelling adoption and widespread use of the standard.

The flat internet protocol (IP) network architecture used in fourth-generation (4G) telecommunications networks such as LTE and WiMAX will provide seamless interoperability between data devices and networks. From a technology provider viewpoint, 4G networks require access to patent rights from areas of traditional telecommunications, wireless data transmission technology, smart antenna and MIMO antenna technology, and computer network packet switching technology. Instead of following the model of traditional telecommunications patent licensing involving a handful of companies, in 4G licensing there will be many patent owners as licensors.

In addition, the subscriber devices operating on 4G networks will include devices beyond mobile phones and traditional laptop computer connections that allow mobile internet access. Many other device categories will utilise 4G data services, such as e-book readers, GPS units, utility meter readers and energy conservation devices, and a wide array of consumer products including digital

cameras, MP3 and other audio players and DVD players. There will be many technology users requiring access to the essential patent rights owned by many licensors.

A patent pool provides an efficient platform for clearing the 4G patent thicket and providing access to the underlying patent licensing transactions for both licensors and licensees. With the availability of efficient licensing pools such as those provided by MPEG LA, companies are free to focus on their business of building and supplying products and services for 4G next-generation networks, instead of devoting disproportionate energy to negotiating patent licences on core 4G technology.

Common misunderstandings involving patent pools

There are several areas of common misunderstanding about what is required to make a successful patent pool and the benefits it provides.

First, not every technology standard may benefit from a patent pool. Some standards are not burdened by patent thickets and some will not be widely adopted in the marketplace, even with the availability of an efficient patent licence. For standards that will not be widely adopted or that do not involve patent thickets, the significant effort and expense required to create a patent pool may not be worthwhile, because bilateral licensing provides an adequate mechanism for accessing the required patent rights.

Second, in order to be viable, a patent pool need not include patents from all known licensors or provide complete patent licensing coverage for a particular technology standard. The purpose of a patent pool is not to solve all patent licensing issues faced by a company, but to provide an efficient, cost-effective patent pool licence as an alternative to negotiating separate patent licences with each pool licensor. In other words, the proper inquiry is whether a pool licence provides a "better" alternative than patent licensing without a pool in place. The question of whether all possible patent owners will be licensors in a pool is a red herring that obscures the simpler economic and practical question of whether a pool provides an efficient licensing alternative to the market when compared with the status quo, for both licensors and licensees.

Elements of the MPEG LA® Licensing Model

Where many users require many licences under many interdependent patents owned by multiple patent owners, a patent pool licence may be useful in promoting

technological innovation and use, permitting freedom of technological movement, reducing the potential for conflict and providing a realistic alternative to traditional bilateral licences. The key elements of the licensing model are outlined below.

Marketability

A licence must be responsive to marketplace needs and to variations on the MPEG LA® Licensing Model suited to meet them.

Without both buyers and sellers, a licence is unmarketable. Among other things:

- Licences should resolve patent thickets (critical mass of essential patent owners with a critical mass of essential patents) that favour a pool licence as an alternative to bilateral licences.
- The subject technology should be of value to a mass market.
- Royalty products should be readily identifiable.
- The licence should reflect a balance of royalty, revenue, administrative fee and other incentives that realise reasonable return to patent owners, reasonable access for licensees, reasonable profit for a licensing administrator and necessary compliance and enforcement efforts.

Legal tenability

A patent pool licence offers fair, reasonable, non-discriminatory access to essential intellectual property, with the goal of including as much intellectual property as possible for the convenience of the market. The patent pool administrator employs independent patent experts to evaluate patents for their essentiality to the defined technology, offers a standard licence agreement with the same terms to everyone, actively markets the licence and takes responsibility for enforcing contractual compliance.

Essentiality and defined field of use

A patent may not be included unless it is infringed by use of the defined technology. This communicates clearly to both licensors and licensees the rights granted by the joint licence and why patents are included or excluded. As a legal matter, it assures that the joint licence is precise enough to include what a licensee needs to practise the particular technology, and that competent competitive implementation options are neither favoured nor foreclosed.

Non-exclusive

Alternative (eg, direct bilateral) licensing options are not precluded to either licensors or licensees.



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Bill Geary is vice president of business development at MPEG LA, where he is responsible for identifying, organising and facilitating new patent pools for licensing by the company. He has been involved in the formation and operation of patent pools in many different technologies for more than 10 years.

Before joining MPEG LA, Mr Geary was general patent counsel in Samsung Electronics' Washington, DC office, where he handled worldwide patent licensing and litigation.

Independence

The licence administrator is neither licensor nor licensee (nor an affiliate of any); both are customers, thus assuring impartial administration of the joint licence with a goal of balancing reasonable access for users with reasonable return to patent owners. Each licensing programme is administered separately, fairly and impartially.

Licensor protections

Licensors share in reasonable allocation of royalties commensurate with their contributions to the licence. The independent patent evaluation process and openness of the joint licence to as many essential patents as possible assure fairness, value and competition law compliance. In addition, to prevent licensees from using the joint licence to protect themselves from lawsuits in order to sue others on their own patents, and to encourage negotiation and innovation in support of the technology platform, a patent owner may remove its patents from licence coverage as to a particular licensee if the licensee brings a lawsuit or other proceeding for infringement of an essential or related patent against the licensor and has refused to grant the licensor a licence on fair and reasonable terms and conditions under the patents on which the lawsuit is based.

Licensee protections

Licensee data is protected as confidential from patent owners, licensees and others. In addition, licensors are required to include all of their patents essential to the defined technology. Licensees are assured most favourable royalty rates and pay the same royalties to MPEG LA whether or not they are patent owners (while at the same time any existing bilateral licences between licensee and licensor may be adjusted directly between them). To assure that a licensee does not take advantage of the joint licence, yet refuse to license its own patents on fair and reasonable terms, any licensee (or affiliate) may add essential patents to the joint licence on the same terms and conditions as other patent holders. But if a licensee chooses not to do so, it agrees to grant back a licence similar in scope to the joint licence rights granted to the licensee on fair and reasonable terms under any essential patents that the licensee and its affiliates may own. In addition, a clear, up-to-date list of licensed patents is maintained, and in the interest of including as much essential intellectual property as possible, the joint licence must remain open for the continuing submission, evaluation

and inclusion of essential patents from both existing and new licensors.

Professional management

The licensing administrator provides a seamless worldwide connection among patent owners, users and technology. This requires:

- A financially sound and motivated organisation with expertise in identifying joint licensing products the market can use.
- Building consensus among fiercely independent patent owners, each with its own expectations of value.
- The development of joint licence products that meet patent owners' interest in a reasonable return and the interest of the marketplace in access to fundamental technology under fair, reasonable terms.
- Intellectual property, antitrust, contract drafting and administration.
- Licensing and marketing.
- Website management.
- Secure online reporting in compliance with audited procedures required by publicly traded companies.
- Licence transaction fulfilment and auditing.
- International tax mitigation and reconciliation.

Conclusion

Wherever an independently administered, one-stop patent licence would provide a convenient alternative to licensing core patented technology, the MPEG LA[®] Licensing Model may provide a solution. By balancing patent users' desire for efficient access to intellectual property with patent owners' interest in reasonable return, while reducing the associated transaction costs, MPEG LA creates the opportunity for wide adoption of new technologies and monetisation of intellectual property and fuels innovation. Today, MPEG LA clears patent thickets in seven licensing programmes covering essential patents in 57 countries (www.mpegla.com). Applying its business model, MPEG LA is developing new programmes for tomorrow in the fields of wireless communication and biotechnology. ■

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EXHIBIT G

Patent Pool Evolution
11 November 2011
Bill Geary

Patent Pool Evolution: Adapting the MPEG LA[®] Licensing Model to Emerging Patent Thickets

- **MPEG LA[®] Licensing Model Review**
- **New Programs**
- **Current Issues**
- **Biotech Licensing Supermarket**

MPEG LA[®] Licensing Model

- MPEG LA pioneered modern patent pool licensing at the transition from analog video to digital video with the MPEG-2 video standard

MPEG LA® Licensing Model

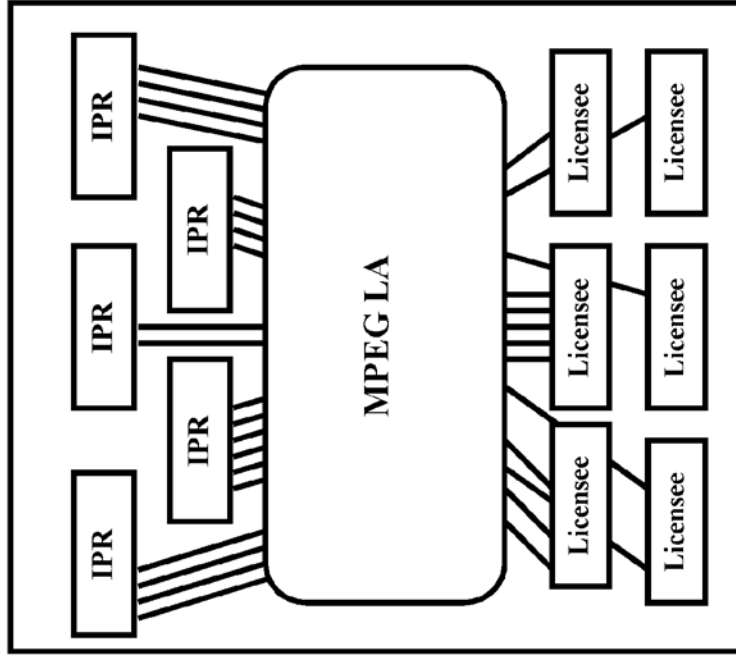
- Biggest challenge to MPEG-2 was access to essential IPR
 - IPR of many parties created risk and potential for conflict if Standard could be used at all given the patent “bottleneck”
- In 1997 after US DOJ Business Review (EC Comfort letter Dec 1998), MPEG LA revolutionized intellectual property rights licensing by offering an alternative as a solution
 - MPEG-2 License grew from initial 8 to 27 patent holders with 159 patent families consisting of more than 900 patents in 57 countries. Not only have MPEG-2 royalty rates not increased, but they have been reduced five times.
 - 1500+ Licensees accounting for most MPEG-2 products (TVs, DVD players/recorders, Blu-ray Disc™ players, set-top boxes, PCs, DVD Video discs, game machines, cameras) in the current world market

MPEG LA[®] Licensing Model

- MPEG-2 became the most successful standard in consumer electronics history
 - ~ 5 billion devices
 - ~ 50 billion video discs
 - ~ \$3.5 trillion in product sales
- Relationship between broad access to standardized technology through a pool license and marketplace adoption of that technology

MPEG LA® Licensing Model

MPEG LA® “Many-to-Many”
Licensing Model



The MPEG LA® Licensing Model enables access to essential IPR owned by multiple IPR owners in a single transaction as a convenient alternative to negotiating separate licenses

MPEG LA is granted a nonexclusive sublicensing right from essential IPR owners, collects and distributes royalties for the benefit of the essential IPR owners, and is paid an administrative fee from royalties collected

MPEG LA[®] Licensing Model

- Today MPEG LA operates licensing programs consisting of more than 5000 patents in 72 countries with over 130 licensors* and 4000 licensees
 - Each program is separately administered under authority granted by Licensors with patents determined to be essential to the technology under license
 - MPEG LA does not advocate or promote the use of any technology. Each pool license is offered for the convenience of users who make their own choices.

* Licensors that participate in multiple programs are counted as a Licensor for each program in which they participate.

MPEG LA Patent Pools

November 2, 2011 Data

MPEG-2 <i>Program started in 1997</i>	Started with 8 patent owners 102 patents	<ul style="list-style-type: none"> ● Currently 27 patent owners ● 944 patents in 57 countries ● 1511 Licensees
ATSC <i>Program started in 2007</i>	Started with 6 patent owners 41 patents	<ul style="list-style-type: none"> ● Currently 8 patent owners ● 218 patents in 27 countries ● 127 Licensees
AVC/H.264 <i>a/k/a MPEG-4 part 10 Program started in 2005</i>	Started with 14 patent owners 20 patents	<ul style="list-style-type: none"> ● Currently 29 patent owners ● 2224 patents in 54 countries ● 1077 Licensees
VC-1 <i>Program started in 2007</i>	Started with 16 patent owners 130 patents	<ul style="list-style-type: none"> ● Currently 18 patent owners ● 682 patents in 35 countries ● 262 Licensees
MPEG-4 Visual part 2 <i>Program started in 2004</i>	Started with 20 patent owners 77 patents	<ul style="list-style-type: none"> ● Currently 29 patent owners ● 1129 patents in 53 countries ● 705 Licensees
MPEG-2 Systems <i>Program started in 2006</i>	Started with 8 patent owners 161 patents	<ul style="list-style-type: none"> ● Currently 11 patent owners ● 215 patents in 29 countries ● 183 Licensees
IEEE 1394 <i>Program started in 1999</i>	Started with 6 patent owners 8 patents	<ul style="list-style-type: none"> ● Currently 10 patent owners ● 273 patents in 22 countries ● 233 Licensees

MPEG LA Patent Pools

Licensors in MPEG LA Pools

November 2, 2011 Data

Alcatel Lucent	Fujitsu Limited	Pantech Co., Ltd.
Apple Inc.	GE Technology Development, Inc.	Polycom, Inc.
British Telecommunications plc	General Instrument Corp./Motorola	Robert Bosch GmbH
Canon, Inc.	Hewlett-Packard Company	Samsung Electronics Co., Ltd.
CIF Licensing, LLC	Hitachi, Ltd.	SANYO Electric Co., Ltd.
Cisco Systems Canada IP Holdings	JVC Kenwood Corporation	Scientific-Atlanta, LLC
Comcast IP Holdings I, LLC	KDDI Corporation	Sharp Corporation
Competitive Technologies, Inc.	Koninklijke Philips Electronics N.V.	Siemens AG
Columbia University	LG Electronics Inc.	Sony Corporation
DAEWOO Electronics Corporation	Microsoft Corporation	STMicroelectronics N.V.
Dolby Laboratories Licensing Corporation	Mitsubishi Electric Corporation	Tandberg Telecom AS
ETRI (Korea)	Multimedia Patent Trust	Telefonaktiebolaget LM Ericsson (Ericsson)
France Télécom, S.A.	Nippon Telegraph and Telephone Corporation (NTT)	Telenor ASA
Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.v.	NTT DOCOMO, Inc.	Thomson Licensing
	Ok! Electric Industry Co., Ltd	Toshiba Corporation
	Oracle America, Inc.	Victor Company of Japan, Ltd. (JVC)
	Panasonic Corporation	Zenith Electronics, LLC

MPEG LA® Licensing Model

Suitable Pool Candidates

- “Patent thickets” (interdependence of complementary patents owned by many and used by many)
 - Drive need for multiple transactions
 - Impede technology adoption, interoperability and use
 - Restrict freedom of operation and design
 - Increase potential for conflict
 - Create threat of holdout
 - Bilateral licenses may be inefficient for many

MPEG LA[®] Licensing Model Suitable Pool Candidates

- To attract both patent owners and patent users, successful patent pools strike a balance between reasonable return on investment and reasonable access

MPEG LA[®] Licensing Model Suitable Pool Candidates

- For patent owners, the MPEG LA[®] Licensing Model means
 - Opportunity for mass market adoption
 - Proportionate return on investment
 - Future innovation

MPEG LA[®] Licensing Model

Suitable Pool Candidates

- For patent users, it means
 - Convenience
 - Access
 - Time, cost and risk savings
 - Opportunity for level playing field
 - Freedom to operate and design
 - Focus on products instead of patent licensing
 - Competition

MPEG LA[®] Licensing Model

Features

- Standard or defined platform/reference model
 - A patent must be “essential”
- Independent patent evaluation process
- Access
 - Objective: to include as much essential IP as possible
 - Purpose: to make technology available to everyone
- Nonexclusive – license of convenience; bilateral licensing options available to Licensors and Licensees
- Freedom of Licensors and Licensees to develop competing products and standards
- Legally tenable

MPEG LA® Licensing Model

Features

- Licensee Protections
 - Licensors include all of their essential patents
 - Most Favorable Royalty Rates
 - Clear license grant
 - Grant-back similar in scope to license grant
 - Licensee data protected as confidential
 - Provide clear, up-to-date list of licensed patents
 - Licensors are Licensees
 - All Licensees (Licensor and non-Licensor) pay the same royalty rates for the same products

MPEG LA® Licensing Model

Features

- Licensors Protections
 - Royalty Distributions
 - Licensors share in reasonable allocation of royalties commensurate with their contributions to the License
 - Independent patent evaluation process and openness of license to as many essential patents as possible assures fairness, value and competition law compliance

MPEG LA® Licensing Model

Lessons Learned

- To be successful, a pool license must
 - Solve a market problem
 - Where freedom of movement and avoidance of conflict are desirable
 - Patent pool licenses are not suited to all technologies
 - Many Licensors
 - Many Licensees
 - Identifiable royalty products
 - Potential for high percentage compliance
 - Patent thickets favoring pool over bilateral licensing solutions. Those that do no offer “serious alternatives” are not valued.
 - Be responsive to the marketplace
 - Priced to sell across mass market – value given for value received. Balance must be struck between reasonable access for users and reasonable return for patent holders in order to encourage both licensee compliance and licensor participation
 - Simple, nondiscriminatory terms
 - Emphasis on packaging and marketability
 - Both Licensees and Licensors are customers

MPEG LA® Licensing Model Programs In Development

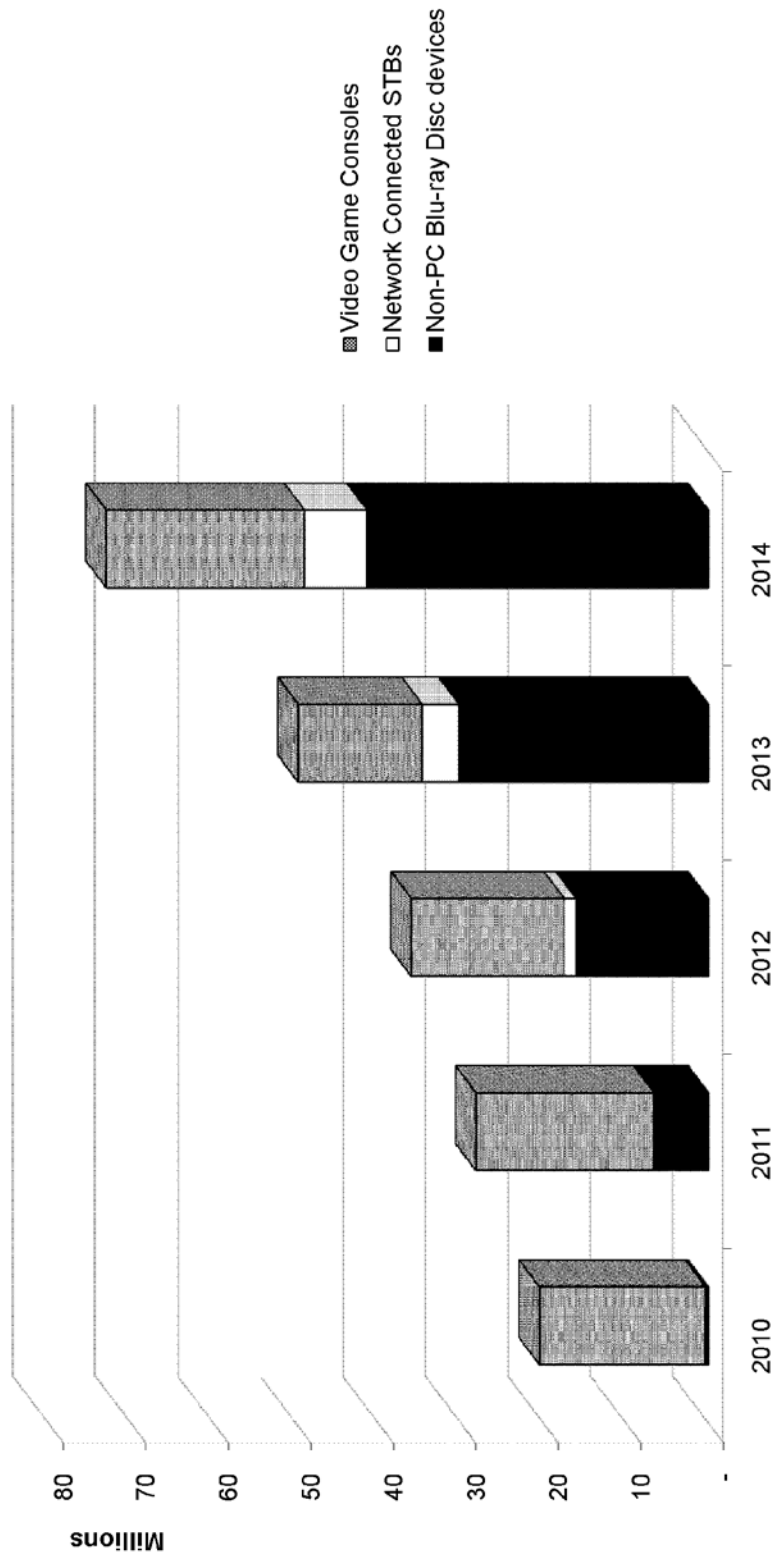
- **Other traditional pools in consumer electronics**
 - MVC (3D Video)
 - VP8 Video
- **LTE 4G wireless technology**
- **Nontraditional “pool” license in medicine**

MPEG LA[®] Licensing Model Programs In Development

MVC (Multiview Video Codec)

- Standard for 3D video; adopted in Blu-ray Disc
- 17 essential patent owners with more under consideration
- Pool is in the final steps before launch

Estimated Worldwide MVC Product Shipments



20 Source: Digital Tech Consulting

MPEG LA[®] Licensing Model Programs In Development

VP8 Video

- 12 patent owners with more under consideration
- Private standard developed by On2 and Google and advertised as patent-free
- Open source with a patent non-assert policy
- Advertised as “free” technology
 - Compare with Android that is “free” but currently being licensed by Microsoft and others, and under attack in many litigations
- Contrast with Microsoft’s WMV9 technology and VC-1

Select Use of VP8

- Chrome Browser
- Skype (limited use)
- ooVoo
- YouTube (limited use)
- NVIDIA
- Logitech

22 Source: Digital Tech Consulting

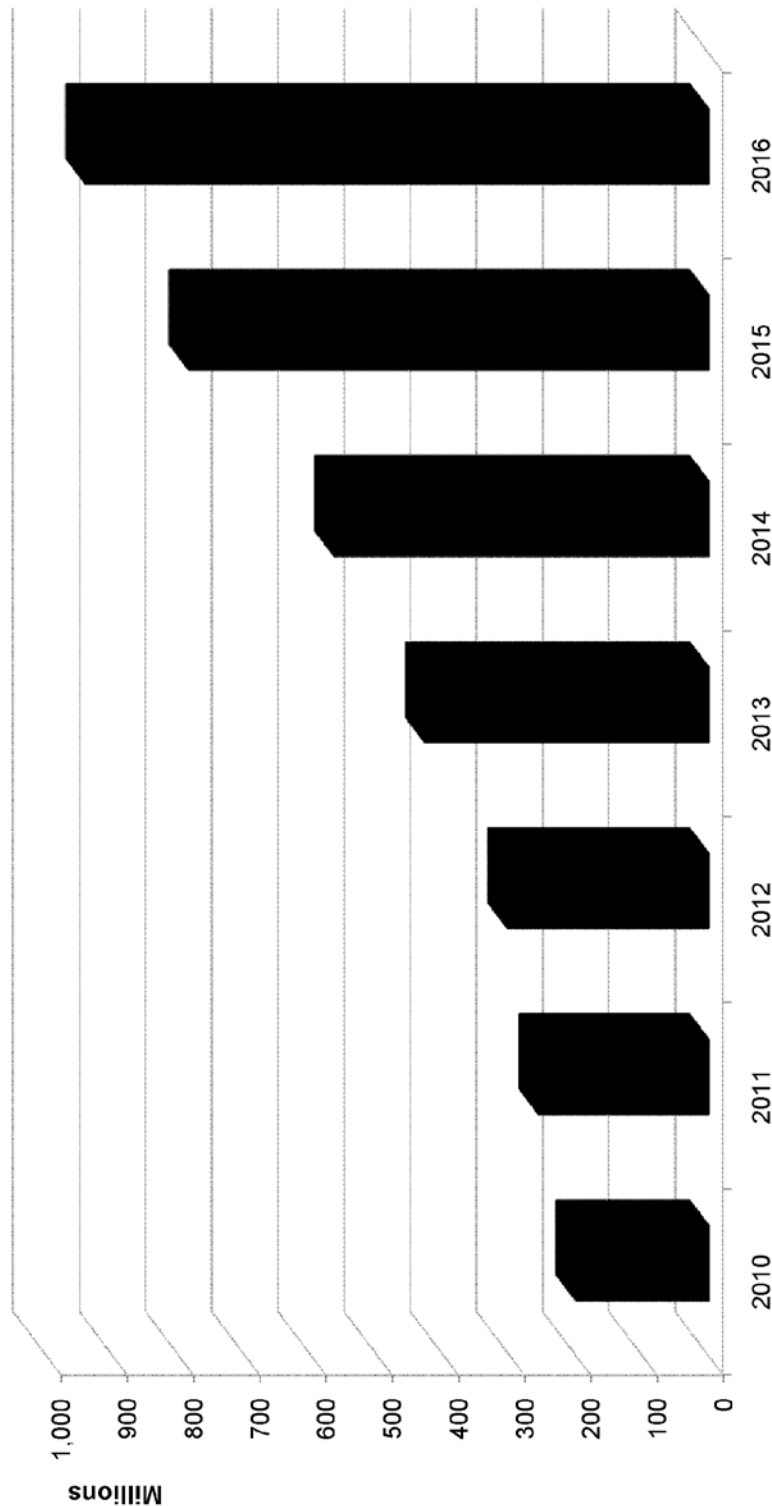
MPEG LA® Licensing Model Programs In Development

LTE 4G wireless technology

- **LTE pooling history (MPEG LA, SISVEL, Via Licensing and NGMN)**
- **Are patents stifling innovation in smartphones?**
- **Smartphone battles**
 - **What is the endgame, royalty or injunction?**
- **In the future will there be more or fewer smartphone and wireless product companies than there are now? How will they be licensed?**
- **EC encourages pools around standards to promote adoption and transparent licensing**

MPEG-4 AVC Mobile Handset Shipments

055



24 Source: Digital Tech Consulting

MPEG LA[®] Licensing Model

Challenge and Opportunity

056

- “One-size fits all” solutions based on technology standards may not be suitable for non-standards-based technologies
- New marketplace tensions are also emerging that make standards-based technologies difficult to pool in the traditional way
- Applying its independent “many-to-many” mass market licensing expertise, MPEG LA has pursued new business models to address new patent thickets

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Changing Healthcare Environment

Scientific Advances

- As a driver of precision (or personalized) medical therapy, molecular diagnostics has the potential to make diagnostics a more important part of the value chain. But restrictive licensing practices in addition to emerging patent thickets (for which “one size fits all” solutions are not suitable) threaten their delivery, the lives they can save and the cost-savings they can achieve. For example:

Changing Healthcare Environment

Patent Thicket Examples

- Lynch Syndrome, a predisposition to various cancers, *e.g.*, colorectal and endometrial, is believed to be caused by mutations in one or more of at least 7 genes covered by 12 patents and 1 published application owned by 10 institutions, and there is reason to believe that the number of gene associations is even larger

Changing Healthcare Environment

Patent Thicket Examples

- At least 46 genes covered by 10 patents and 4 published applications (many exclusively licensed) owned by 12 institutions have been linked to childhood hearing loss, an estimated 50-60% of childhood hearing loss is caused by genetic factors, and there is reason to believe that the number of gene associations is even larger

Changing Healthcare Environment Patent Thicket Examples

- Cardiovascular diseases (CVDs) have been linked to at least 47 genes covered by 20 patents and 11 published applications owned by 20 patent owners, and there is reason to believe that the number of gene associations is even larger*

* CVDs are multifactorial disorders associated with both genetic and environmental factors

Changing Healthcare Environment

Patent Thicket Examples

- At least 23 genes have been associated with schizophrenia based on clinical data, as many as 631 positive and negative gene associations also have been reported, and there is reason to believe that the number of gene associations is even larger. At least 15 patents and 6 published applications owned by 16 institutions contain claims to the genetic sequences or methods of diagnosing schizophrenia.

Changing Healthcare Environment Patent Thicket Examples

- The leading test for breast and ovarian cancer administered exclusively by Myriad Genetics (owner of related genetic patents sought to be invalidated in recent lawsuit) involves BRCA1 and BRCA2 gene mutations accounting for 5 to 10 percent of all breast cancer cases and up to 14 percent of all ovarian cancer cases; hundreds of different gene mutations covered by many patents may be responsible for other occurrences

The Licensing Supermarket

- With the goal of clearing patent rights enabling researchers, laboratories and testing companies to design comprehensive diagnostic genetics test panels, thereby making such tests widely available to the public, calls for a new business model with pro-competitive benefits similar to pools

The Licensing Supermarket

- A diagnostics licensing supermarket can drive efficient use of limited medical resources in support of tests for diagnosis of disease that realize the potential to make personalized medical solutions widely available to the marketplace of patent owners, research institutions, multiplex test developers, drug and device makers, labs, healthcare providers, patients and society.
- MPEGLA's Librassay™ precision licensing source is set to launch Q1 2012.

065 Librassay™

What's on the Shelf?

- Many of these patents are owned by academic and research institutions. MPEG LA has well-established relationships, a licensing supermarket is compatible with their technology transfer goals and MPEG LA is concluding terms with market leaders.
 - Complies with Bayh-Dole requirement to make technology widely available – public good – by creating new market for a nonexclusive licensing alternative in diagnostic field of use
 - New market also incentivizes discovery by enabling aggregation of small technologies in attractive bundles that may otherwise not be licensed
 - Makes affordable pricing possible
 - Promotes industry / university partnerships
 - Can generate licensing income, which patent holders can use to fuel new innovation

The Licensing Supermarket

- MPEG LA's licensing supermarket also may be ideal for addressing patent thickets in other biotech and emerging technology areas, thereby giving
 - Users the opportunity to address patent licensing needs with cost predictability
 - Patent owners the opportunity to monetize their intellectual property
 - Mass markets the opportunity to receive the benefits of new technology

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